cal observations of the British National Antarctic Expedition, commanded by Commander R. F. Scott, R. N., which left Cowes in August, 1901, and returned to Spithead in September, 1904.[1] This volume has been prepared under the superintendence of Doctor Shaw, Director of the Meteorological Office, with the cooperation of a committee of the Royal Society; and several eminent British meteorologists, official and otherwise, contribute to the discussion of the several kinds of observations. An extended review of this publication appears in Nature of December 17, 1908. The expedition has rendered a splendid service to meteorology in obtaining two years of continuous observations at a station far within the Antarctic Circle (lat. 77° 50′ 50″ S.).

Especially timely and interesting is Doctor Shaw's review of the question as to the existence of a permanent anticyclone over the South Polar Continent (p. x-xiv). This question remains unsettled.

AEROLOGICAL EXPEDITION TO EAST AFRICA.

Das Wetter announces that the aerological expedition of the Royal Aeronautical Observatory at Lindenberg, to the Victoria Nyanza and the coast of East Africa, fitted out at the expense of Messrs. W. Tepelmann, Brunswick (Friedr. Vieweg & Sohn); Prinzhorn, of the Continental Caoutchouc and Gutta Percha Company, Hanover; Arnhold, Berlin; and von Guillaume, Cologne, sailed in June under the conduct of Professor Berson, of Lindenberg, Doctor Elias, of Berlin, and balloon inspector Mund, of the aeronautical observatory. It was to have returned at the end of December, after having made a series of ascensions on Victoria Lake and on the east coast of Africa from Mombassa to Delagoa Bay, with kites, registering balloons, and pilot balloons—the latter up to a height of 22,000 meters. Most important data have been obtained on the monsoon winds and the processes in the upper layers of the atmosphere, in the interior of Africa, under the equator, and on the Indian Ocean.

TORNADOES IN ARKANSAS DURING NOVEMBER, 1908.

At 8 a. m. November 23, 1908, a small low of moderate intensity (pressure 29.65 inches at center) was central over the northwestern corner of Arkansas. Rain had recently fallen, or was falling, over the northern two-thirds of Kansas and over eastern Oklahoma, with thunderstorms at Little Rock, Ark., and Memphis, Tenn. Southerly and southeasterly winds prevailed over the States bordering the lower Mississippi on the west.

This low (No. 1) moved northeastward, rapidly increasing in intensity, and by 8 a. m. of the 24th its center was over Des Moines, Iowa, with a pressure of 29.35 inches, or lower. Simultaneously a second and almost equally intense low (No. 2) had developed over southeastern Utah, accompanied by snow in the southeastern quadrant. The whole Mississippi Valley was included in the rain area of the low No. 1, and a number of thunderstorms occurred in its southeastern quadrant.

By 8 a. m. of the 25th the low No. 2 had moved south-southeastward into Texas and then turned northeastward to a position central over Dodge City, Kans., with a pressure of 29.40 inches, while low No. 1 had moved northward but a short distance to Duluth, Minn. The whole country, except for the Atlantic and Gulf shores, was involved in rain, and a belt of thunderstorms reached from Dodge City, Kans., to Milwaukee, Wis.

Tornadoes of November 23, 1908.

The weather conditions outlined above proved particularly favorable for the development of tornadoes in Oklahoma, western Arkansas, and southern Missouri during the afternoon and evening of November 23, and again in eastern Arkansas on the afternoon of November 25. Except for local deflections due to local topographic features, the tornadoes travelled from the southwest to the northeast in all cases, as shown by the map, fig 1. There seem to have been two and perhaps three distinct periods of tornado development on the 23d.

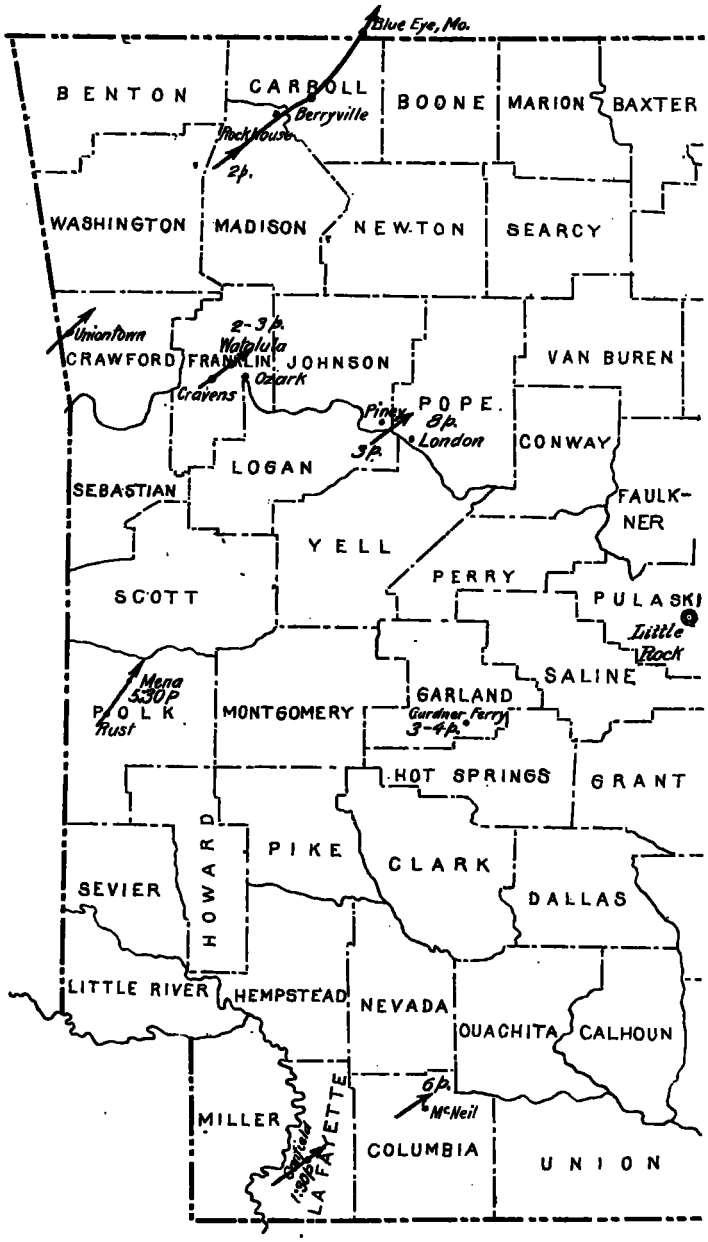

FIG. 1.—Tracks of tornadoes in western Arkansas November 23, 1908.

The earliest reported occurrences came between 1:30 and 2 p. m. Canfield, Lafayette County., Ark., was visited at 1:30 p. m. by a tornado moving from southwest to northeast, which destroyed $1,500 of property, over a path about one-fourth mile wide, and injured four persons, none fatally. At about 2 p. m. a tornado passed 15 miles northwest of Huntsville, Madison County, Ark., traveling in the same general direction along a path one-fourth mile wide. It did much damage near Huntsville and slightly injured several persons. This same tornado evidently continued past Rock House into Carroll County, Ark., causing damage to the amount of $50,000 in the vicinity of Berryville, Carroll County, which it reached at 2:15 p. m.; it past out of the State into Missouri at Blue Eye, Stone County, Mo., and there blew away a school house without injuring the

[1] National antarctic expedition, 1901–1904. Meteorology, part 1. Observations at winter quarters and on sledge journeys, with discussions by various authors. Prepared under the superintendence of the Director of the Meteorological Office with the cooperation of a committee of the Royal Society. London, 1908.

school children then in it. No further reports of this storm have been received. Its path was 150 yards wide at Berryville.

Between 2 and 3 p. m. a severe tornado, with a path 30 yards wide, struck Cravens, Franklin County, Ark, destroying many buildings, killing four persons and injuring many others. This same storm killed fourteen persons at Watalula and injured several at Jethro, Franklin County, Ark., before it died out within 20 miles of the latter place.

Between 3 and 4 p. m. another tornado past northeastward and eastward along the Arkansas River between Piney, Johnson County, Ark., and London, Pope County, Ark., destroying much timber, several farm-houses, and injuring thirty or forty persons. The path of this storm was about 300 yards wide. The damage is estimated at $25,000. About the same time a tornado in Garland County, Ark., struck the small frame schoolhouse at Gardener Ferry, lifted it with the assembled school and set all down unhurt 20 feet distant. Another tornado past northeastward thru Crawford County, Ark., about one-half mile north of Uniontown, and mowed a clean path about 100 yards wide thru the forests and across farms. A number of small houses were demolished and one farmer was injured.

At 5 p. m. a tornado past 1 mile north of Rust, Polk County, Ark., and shortly afterward past thru the northern part of Mena, about 5 miles from Rust. Two persons were reported killed and three injured at Rust. At Mena two houses were wrecked and four or five persons injured. This storm had a path 50 to 100 yards wide and was followed by heavy hail. The damage was estimated at $5,000. At 6 p. m. a tornado past 1 mile north of McNeil, Columbia County, Ark., but at the time it was too dark to see the funnel-shaped cloud. Its path was about 150 yards wide and it destroyed houses and fencing to the value of $400 without injuring any persons. The indicated path of this tornado would seem to be a continuation of the one reported at Canfield at 1:30 p. m. the same day.

Tornado of November 25, 1908.

On November 25 a severe tornado traversed Green County, in northeastern Arkansas, from southwest to northeast. The The first report was from Lorado, near the southern line of the county. The tornado appeared here between 3:30 and 4 p. m., moved northeastward with a destructive path 75 to 150 yards wide and about 5 miles long. One child was killed and four other persons injured, the 3-room school building had one end blown outward from bottom to top, and two churches and a parsonage were also wrecked. The damage was estimated at $30,000. The storm continued to a point 2 miles east of Walcott, having there a path about 50 yards wide. Here one boy was killed and five adults injured, while damage to the extent of $20,000 was reported. Newspaper reports indicate considerable damage in the more rural districts from which no direct reports are available.

TORNADO IN OKLAHOMA.

Newspaper clippings report that a tornado past over the North Flats, near the Holmes Ranch, 30 miles northeast of Kenton, Okla., along the New Mexico–Oklahoma boundary, on November 23. Many piles of lumber were carried 50 miles from the South Flat region and dropt over the North Flats.—*C. A., jr.*

THE WEATHER OF THE MONTH.

By Mr. P. C. DAY, Acting Chief, Climatological Division.

PRESSURE AND WINDS.

The distribution of the mean atmospheric pressure for December, 1908, over the United States and Canada, is graphically shown on Chart VI, and the average values and departures from the normal are shown for each station in Tables I and III.

The variations of the mean pressure for the month from the December normal were not marked by any special features. Comparatively high pressure dominated the Gulf States, and the usual winter area of high pressure over the central Rocky Mountain district and thence westward to the Pacific, was somewhat more pronounced than usual.

The average pressure for the month was below the normal from the Missouri Valley eastward and southeastward to the Atlantic coast, while from Texas westward and northwestward to the Pacific coast, it was above the normal, the maximum excesses, .05 to .15 inch, embracing the Rocky Mountain region from southern New Mexico to British Columbia.

As in the preceding month the continued prevalence of moderately high pressure over the mountain districts was unfavorable to the formation of storm centers over those regions, and the majority of the low areas that developed during the month appear to have had their origin on the Great Plains of the Canadian Northwest.

The high pressure along the eastern slope of the Rocky Mountains and over the southern portions of the Great Plains, was probably instrumental in confining the storms that developed over the Canadian Northwest to the northern circuit in their progress eastward.

As a result but few storm centers crost the interior portions of the United States and the month, as a whole, was remarkably free from adverse weather conditions.

With high pressure over the Rocky Mountain region and thence southeasterly to the lower Mississippi Valley, the districts to the northeast were under the influence of frequent warm southerly winds. In the middle and southern Rocky Mountain, Plateau, and Pacific coast districts, cold northerly winds were of frequent occurrence.

TEMPERATURE.

The month of December, 1908, opened with an extensive area of high pressure covering the northwest, accompanied by the first well-marked cold wave of the season. Temperatures from zero to 10° below were reported on the mornings of the 1st and 2d from points in the upper Missouri Valley, and the cold area gradually overspread the eastern and southern districts during the 3d and 4th. A second cold wave appeared over the upper Missouri Valley on the morning of the 6th, with temperatures from 10° to 20° below zero over northern Minnesota, North Dakota, and Montana, and moved rapidly southeastward to the south Atlantic and Gulf coasts by the 8th. Moderate temperatures prevailed from the last-named date till about the 30th, when cold weather again set in over the northern Rocky Mountain district, and at the end of the year had overspread the district from the Rocky Mountains eastward to the Mississippi and Ohio valleys and Lake region, with temperatures from 10° to 20° below zero along the northern border from the upper Lakes westward to eastern Montana on the morning of the 31st.

During the first decade the mean temperature ranged from 4° to 10° below the normal over most of the interior districts, but was generally above normal along the Atlantic and Gulf coasts, the Mexican border, and generally over the Pacific coast States. Unusually high temperatures prevailed on the 1st along the immediate Atlantic and Gulf coasts, where temperatures as high or higher than previously recorded during the first decade of December occurred.

During the second decade the mean temperature was above the normal from 3° to 10° over all interior districts from the Rocky Mountains eastward, while over the western district it ranged from 3° to 7° below. From the 16th to the 18th some unusually high maximum temperatures occurred over the